

CANADA'S ARCTIC WATERWAYS

[Review by Douglas Bradford* of W. E. Markham's *Ice atlas: Canadian Arctic waterways*. Ottawa, Environment Canada, 1981. Canadian \$120.00.]

Considering the dearth of published climatic ice data for the Canadian Arctic the appearance of W. E. Markham's atlas is a welcome event. It pulls together in maps, text and tables an enormous amount of observed ice data collected over a period of roughly 25 years, beginning in the early 1950s, and presents it in 315 charts depicting regional ice concentrations and distributions. The atlas also contains useful background information on monthly and seasonal air temperatures, wind speed, and direction, melting and freezing degree days, measured ice thickness and sea level pressure.

Two sets of maps are featured, one displaying the median amount of *all* ice, the other the median amount of *old* (second-year and multi-year combined) ice. These appear as weekly charts on facing pages, greatly facilitating comparison. Also, their large size (roughly 280 × 200 mm), combined with their presentation in three separate sections covering eastern, northern and western Arctic waters respectively, allows the inclusion of considerable detail even in relatively confined channels. Together, the two sets provide excellent and illuminating coverage of the ice regime.

Each of the three sections also contains sets of smaller charts depicting weekly maximum and minimum conditions and the formation of new ice in the freeze-up period.

The atlas is based chiefly on material obtained on routine ice reconnaissance flights, supplemented to some extent in recent years by satellite data. As the reconnaissance programme was designed primarily to support Arctic shipping, the vast majority (all but six) of the maps are confined to the period 21 May to 29 October. It would have been helpful to reflect this summer bias in the title.

The presentation of data by medians sometimes leads to difficulties. It indicates, for example, the presence of open water in most years through the North-west Passage via Peel Sound or Prince Regent Inlet for a three week period commencing early in September. This apparent absence of ice is somewhat unsettling, as one cannot help but remember the obstacles which ice presented to the early explorers. In the text the author takes pains to explain the merits of the median. However, one can easily think of cases where the mean or mode might have been more revealing. In any event, given the orientation of the atlas towards shipping interests, some indication of the probability of difficult ice conditions occurring would have been appropriate.

Probably the most curious feature revealed by the charts is the apparent explosion in old ice concentration which seems to occur in Baffin Bay between June 4 and June 25. Similar curiosities show up in Parry Channel, and although explanations are provided in the text the matter is left hanging and one is left with doubts about the overall accuracy of the old ice charts. Other weaknesses are the lack of information on ridges, ice roughness and floe size, the lack of maps showing iceberg distribution, and the inaccuracy of the table of contents.

All things considered, however, the atlas is a much needed, long overdue contribution to Arctic ice studies. Its pleasing format and wealth of material capture and hold one's interest. Its detailed characterization of the ice regime make it an excellent planning tool. Perhaps most important, the curiosities which it brings to light suggest interesting avenues for further ice studies.

In Brief

RECORD LOW TEMPERATURE AT THE SOUTH POLE

American meteorologists at Amundsen-Scott South Pole station reported a record low air temperature of -117°F (-83°C) on 23 June 1982. Coming close to mid-winter, during a period of clear skies and light winds, this beat by 4°F the long-standing record of -113°F (-81°C) measured at

* Intergovernmental Ocean Sciences, Department of Fisheries and Oceans, 240 Sparks Street, Ottawa K1A 0E6, Canada.